Name: ——————————————————————   score:——— / 10

There are 10 points possible on this quiz. No aids (book, notes, etc.) are permitted. You may use a non-programmable calculator. **Show all work and supporting calculations for full credit. Explain how you get your answers.**

1. (4 points) In 2021, the Alaska Division of Elections ran a mock Ranked Choice Voting election to help voters learn about RCV (also known as Instant Runoff Voting, IRV). The mock election was to determine the Best Seafood in Alaska, and the candidates were King Crab (KC), King Salmon (KS), Scallops (S) and Pollock (P). Here is a pretend preference schedule for a pretend local version of this election.

number of voters	18	4	40	38	60	80
1st choice	P	P	S	KC	KC	KS
2nd choice	S	KS	KS	KS	KS	KC
3rd choice	KC	S	KC	P	S	P
4th choice	KS	KC	P	S	P	S

$$\frac{240}{2} + 1 = \boxed{121}$$

(a) How many voters are needed for a majority? (show your work clearly!) ————————

$$18 + 4 + 40 + 38 + 60 + 80 = 240$$

(b) Find the winner under the Instant Runoff Voting / Ranked Choice Voting method. Show each round clearly. For each round, **state the vote tally** and **clearly identify** the candidate eliminated.

Round 1: P gets 22, S gets 40, KC gets 98, KS gets 80
P eliminated

Round 2:

	18	4	40	38	60	80
1st	S	KS	S	KC	KC	KS
2nd	KC	S	KS	KS	KS	KC
3rd	KS	KC	KC	S	S	S

KS: 84
KC: 98
S: 58

S eliminated

Round 3:

	18	4	40	38	60	80
1st	KC	KS	KS	KC	KC	KS
2nd	KS	KC	KC	KS	KS	KC

KC: 116
KS: 124

IRV/RCV Winner: __King Salmon (KS)__

2. (3 points) Here is the same preference schedule.

number of voters	18	4	40	38	60	80
1st choice	P	P	S	KC	KC	KS
2nd choice	S	KS	KS	KS	KS	KC
3rd choice	KC	S	KC	P	S	P
4th choice	KS	KC	P	S	P	S

Find the winner under the **Borda Count** method. Show your work/computations clearly.

$$KS: 1(18) + 3(4) + 3(40) + 3(38) + 3(60) + 4(80) = 764$$
$$KC: 2(18) + 1(4) + 2(40) + 4(38) + 4(60) + 3(80) = 752$$
$$S: 3(18) + 2(4) + 4(40) + 1(38) + 2(60) + 1(80) = 460$$
$$P: 4(18) + 4(4) + 1(40) + 2(38) + 1(60) + 2(80) = 424$$

Borda Count Winner: ___King Salmon (KS)___

3. (2 points) The results of all head-to-head matchups in this election are shown below. Fill in the last row of the chart and then determine the winner of the election using **Copeland's Method** / if there is a tie explain why. Show supporting work.

race	P vs S		P vs KC		P vs KS		S vs KC		S vs KS		KC vs KS	
	P	S	P	KC	P	KS	S	KC	S	KS	KC	KS
Totals	120	120	22	218	22	218	62	178	58	182	136	104
winner/tie	tie		KC		KS		KC		KS		KC	

KS: 2
KC: 3
P: 0.5
S: 0.5

Copeland's Method Winner: ___King Crab (KC)___

4. (1 point) Who do you think should be the winner of this election? Explain/justify your answer to a classmate. There are many good answers. The important thing is that you provide reasons to justify your answer. For instance, I might say that I think King Salmon should win because it won under two of the three methods we used.